

AN
ESSAY

Concerning the
Multiplication of Mankind :

Together with another

ESSAY

IN

Political Arithmetick,

Concerning the Growth of the

City of London :

WITH THE

Measures, Periods, Causes, and Con-
sequences thereof. 1682.

The Second Edition Revised and Enlarged.

By Sir **WILLIAM PETTY**,
Fellow of the Royal Society.

Licensed,

Jan. 9. 1686.

Rob. Midgley.

LONDON: Printed for Mark Pardon, at the Black-Raven
over against Bedford-house in the Strand. 1686.

AN

ESSAYS

Concerning the

Multiplication of Numbers

Together with several

ESSAYS

IN

Political Arithmetick

Concerning the Growth of the

City of London

WITH THE

Advantages, Benefits, and Con-
siderations thereof, 1682.

By Sir Wm. Petty, Bart.
Fellow of the Royal Society

London, Printed by J. Streater, at the Black Swan
in Strand, 1682.

THE STATIONER

To the READER.

THe ensuing Essay concerning the Growth of the City of London, was intended [Another Essay] animating that ~~other~~ other Essay had preceded it, which was not to be found. I having been much importuned for that precedent Essay, have found that the same was about the Growth, Encrease, and Multiplication of Mankind, which Subject should in Order of Nature precede that of the Growth of the City of London, but am not able to procure the Essay it self, onely I have obtained from a Gentleman, who sometimes corresponded with Sir W. Petty, an Extract of a Letter from Sir William to him, which I verily believe containeth the scope thereof; wherefore, I must desire the Reader to be content therewith, till more can be had.

THE
STATI^{ONER}
~~TO THE READER~~

The Extract of a Letter concerning the scope of an ESSAY intended to precede Another Essay concerning the Growth of the City of LONDON, &c. An Essay in Boletical Arithmetick, concerning the Value and Encrease of People and Colonies.

THE scope of this Essay, is concerning People and Colonies, and to make way for Another Essay concerning the Growth of the City of London. I desire in this first Essay to give the World some light, concerning the Numbers of People in England, with Wales, and in Ireland; as also, of the

number of Houses, and Families
wherein they live, and of Acres they
occupy.

2. How many live upon their Lands,
how many upon their Personal Estates,
and Camerles, and how many upon Art,
and Labour; how many upon Alms,
how many upon Offices and Publick
Employments, and how many as Cheats
and Thieves; how many are Impo-
tents, Children, and decrepit Old
men.

3. How many upon the Poll-Taxes
in England do pay extraordinary Rates,
and how many at the Level.

4. How many Men and Women
are Prolifick, and how many of each
are Married or Unmarried.

5. What the Value of People are
in England, and what in Ireland at a
Medium, both as Members of the
Church or Commonwealth, or as Slaves
and Servants to one another; with a
Me-

Method how to estimate the same, in
any other Country or Colony.

6. How to compute the Value of
Land in Colonies, in comparison to
England and Ireland.

7. How to thousand People in a
Colony may be, and planted to the best
advantage.

8. A Conjecture in what number of
years England and Ireland may be full-
ly Peopled, as also all America, and
lastly the whole habitable Earth.

9. What part of the Earths-Globe
were fittest for a general and univer-
sal Emporium, whereby all the People
thereof may best enjoy one anothers
Labours and Commodities.

10. Whether the speedy Peopling
of the Earth would make

1. For the good of Mankind.

2. To fulfil the revealed Will of
God.

3. To what Prince or State the
same would be most advan-
tagious.

11. An exhortation to all thinking Men to save the Scriptures and other good Histories, concerning the Number of People in all Ages of the World, in the great Cities thereof, and elsewhere.

12. An Appendix concerning the different Number of Sea-fish and Wild-fowl, at the end of every thousand years, since Noah's Flood.

13. An Hypothesis of the use of those spaces (of about 8000 miles through) within the Globe of our Earth, supposing a shell of 150 miles thick.

14. What may be the meaning of Glorified Bodies, in case the place of the Blessed shall be without the Convex of the Orb of the fixed Stars; if that the whole System of the World was made for the use of our Earth-men.

The Principle Points of this Discourse.

1. **T**HAT London doubles in
Forty Years, and all England
in Three hundred and sixty Years.

2. That there be, Anno 1682, about
six hundred and seventy thousand Souls
in London, and about seven Millions,
four hundred Thousand in all England
and Wales, and about twenty eight Mil-
lions of Acres of profitable Land.

3. That the Periods of doubling the
People, are found to be in all Degrees,
from between Ten, to Twelve hundred
Years.

4. That the Growth of London must
stop of its self, before the Year 1800.

5. A Table helping to understand the
Scriptures, concerning the Number of
People mentioned in them.

6. That the World will be fully Peopled within the next two Thousand Years.

7. Twelve ways whereby to Try any Proposal, pretended for the Publick Good.

8. How the City of London may be made (Morally speaking) Invincible.

9. An help to uniformity in Religion.

10. That 'tis possible to encrease Mankind by Generation four times more than at present.

11. The Plagues of London is the Chief Impediment and Objection, against the Growth of the City.

12. That an Exact Account of the People is Necessary in this Matter.

*Of the Growth of the CITY of
LONDON: And of the
Measures, Periods, Causes,
and Consequences thereof.*

What is **B**Y the City of London, we mean the Housing
meant by **L**ONDON, within the Walls of
the Old City, with the Liberties
thereof, *Westminster*, the Borough of
Southwark, and so much of the built
Ground in *Middlesex* and *Surrey*,
whose Houses are contiguous unto,
or within Call of those afore-men-
tioned. Or else we mean the Hou-
sing which stand upon the Ninety
seven Parishes within the Walls of
London; upon the Sixteen Parishes
next, without them; the Six Parishes
of *Westminster*, and the Fourteen out-
Parishes

Parishes in *Middlesex* and *Surrey*, contiguous to the former, all which One hundred and thirty three Parishes are comprehended within the Weekly Bills of Mortality.

The Growth of this City is Measured. What is meant by the Growth of London, 1. By the Quantity of Ground, or Number of Acres upon which it stands. 2. By the Number of Houses, as the same appears by the Hearth-books and late Maps. 3. By the Cubical Content of the said Housing. 4. By the Flooring of the same. 5. By the Number of Days work, or Charge of Building the said Houses. 6. By the Value of the said Houses, according to their Yearly Rent, and Number of Years Purchase. 7. By the Number of Inhabitants; according to which latter sense onely, we make our Computations in this Essay.

— Till a better Rule can be obtain-

ed, we conceive that the Proportion
of the People may be sufficiently Mea-
sured by the Proportion of the Burials
in such Years as were neither remark-
able for extraordinary Healthfulness or
Sickliness.

In what Mea-
sures the City
hath increas'd.

That the City hath In-
creased in this latter sense,
appears from the Bills of
Mortality, represented in the two
following Tables, viz. One where-
of is a continuation for Eighteen
Years, ending 1682. of that Table
which was Published in the 17th
pag. of the Book of the Observati-
ons upon the London Bills of Morta-
lity, Printed in the Year 1676.
The other sheweth what Number of
People dyed at a Medium of two
Years, indifferently taken, at about
Twenty Years distance from each
other.

[41]

The first of the said two Tables.

An. Dom.	97 Parishes.	18 Parishes.	Our Parishes.	Buried in all.	Buried of the Plague.	JA Christen d
1665	5320	12463	10925	28708	68596	9967
1666	1689	3969	5082	10740	1998	8997
1667	761	6405	8641	15807	35	10938
1668	796	6865	9603	17267	14	11633
1669	1323	7500	10440	19263	3	12335
1670	1890	7808	10500	20198		11997
1671	1723	5938	8063	13724	5	12510
1672	2237	6788	9200	18225	5	12593
1673	2307	6302	8890	17499	5	11895
1674	2801	7522	10875	21198	3	11851
1675	2555	5986	8702	17243	1	11775
1676	2756	6508	9466	18730	2	12399
1677	2817	6632	9616	19065	2	12626
1678	3060	6705	10908	20673	5	12601
1679	3074	7481	11173	21728	2	12288
1680	3076	7066	10911	21053		11747
1681	3669	8136	12166	23971		13355
1682	2975	7009	10707	20691		12653

(According to which latter Table, there died as followeth.

The

The latter of the said two Tables.

There died in London,

At a Medium between the Years.

1604 and	1605	—	5135.	A.
1621 and	1622	—	8527.	B.
1641 and	1642	—	11883.	C.
1661 and	1662	—	15148.	D.
1681 and	1682	—	22331.	E.

Wherein Observe, That the Number C. is double to A. and 806 over. That D. is double to B. within 1906. That C. and D. is double to A. B. within 293. That E. is double to C. within 1435. That D. and E. is double to B. and C. within 3341. And that C and D. and E. are double to A. and B. and C. within 1736. And that E. is above Quadruple to A. All which differences (every way considered) do allow the doubling of the People of *London* in forty Years, to be a sufficient estimate thereof in round Num.

Numbers, and without the trouble
 of Fractions. We also say, That
 669930 is near the Number of Peo-
 ple now in London, because the Bu-
 rials are 22331 which Multiplied
 by 30, (one dying yearly out of 30,
 as appears in the 94 pag. of the afore-
 mentioned Observations) maketh
 the said Number; and because there
 are 84 Thousand Tenanted Houles
 (as we are Credibly informed) which
 at 8 in each, makes 672 Thousand
 Souls; the said two Accounts differing
 inconsiderably from each other.

We have thus pretty well found
 out in what Number of Years (*viz.*
 in about 40.) that the City of Lon-
 don hath doubled, and the present
 Number of *Inhabitants* to be about
 670 Thousand. We must now also
 endeavour the same for the whole
Territory of England and Wales. In
 Order whereunto, we

First

The People of London are about the Eleventh part of all England and Wales.

The People of England about 7 Millions and 400 Thousand.

First say, That the Assessment of London is about an Eleventh part of the whole Territory, and therefore that the People of the whole may well be Eleven times that of London, viz. about 7 Millions, 369 Thousand Souls; with which Account that of the Poll-Money, Hearth-Money, and the Bishops late Numbring of the Communicants, do pretty well agree; wherefore although the said Number of 7 Millions, 369 Thousand, be not (as it cannot be) a demonstrated Truth, yet it will serve for a good Supposition, which is as much as we want at present.

As for the time in which the People double, it is yet more hard to be found: For we have good Experience (in the said 94 pag. of the afore-mentioned Observations) That in.

in the Country ; but one of fifty die *per Annum* ; and by other late Accounts, that there have been sometimes but 24 *Births* for 23 *Burials* : The which two points, if they were universally, and constantly true, there would be colour enough to say, that the People doubled but in about 1200 years. As for Example : Suppose there be 600 People, of which let a fiftieth part die *per Annum*, then there shall die 12 *per Annum* ; and if the *Births* be as 24 to 23, then the Increase of the People shall be somewhat above half a Man *per Annum*, and consequently the supposed Number of 600, cannot be doubled but in 1126 Years, which to reckon in round Numbers, and for that the afore-mentioned Fractions were not exact, we had rather call 1200.

There are also other good *Observations*, That even in the Country, one in about 30, or 32 *per Annum*.

hath died , and that there have been five *Births* for four *Burials*. Now, according to this Doctrine , 20 will die *per Annum* out of the above 600, and 25 will be born , so as the *Increase* will be 5 , which is a hundred and twentieth part of the said 600. So as we have two fair *Computations*, differing from each other as one to ten ; and there are also several other good *Observations* for other *Measures*.

I might here Insert, That although the Births in this last Computation be 25 of 600 , or a Twenty fourth part of the People ; yet that in Natural possibility , they may be near thrice as many, and near 75. For that by some late *Observations*, the *Teeming* Females between 15 and 44, are about 180 of the said 600 , and the *Males* of between 18 and 59, are about 180 also, and that every *Teeming Woman* can bear a *Child* once

once in two Years; from all which it is plain, that the Births may be 90, (and abating 15 for Sickness, Young Abortions, and Natural Barrenness) there may remain 75 Births, which is an Eighth of the People; which by some Observations we have found to be but a two and thirtieth part, or but a quarter of what is thus shewn to be Naturally possible. Now, according to this Reasoning, if the Births may be 75 of 600, and the Burials but 15, then the Annual Increase of the People will be 60; and so the said 600 People may double in 10 Years, which differs yet more from 1200, above-mentioned. Now to get out of this Difficulty, and to temper those vast disagreements, I took the Medium of 50 and 30 dying per Annum, and pitch'd upon 40; and I also took the Medium between 24 Births and 23 Burials, and 5 Births for 4 Burials,

rials, viz. allowing about 10 *Births* for 9 *Burials* ; upon which Supposition, there must die 15 *per Annum* out of the above-mentioned 600 , and the *Births* must be 16 and two thirds, and the Increase 1 , and two Thirds , or five Thirds of a Man ,

That the time of which Number compared with 1800 *Thirds*, doubling is here, and now 360 or 600 Men, gives 360 Years.

Years for the time of doubling (including some Allowance for *Wars*, *Plagues*, and *Famine*, the Effects whereof , though they be *Terrible* at the Times and Places where they happen , yet in a period of 360 Years , is no great matter in the whole Nation. For the *Plagues* of *England* in 20 Years hath carried away scarce an Eightieth part of the People of the whole Nation ; and the late 10 Years *Civil Wars* , (the like whereof hath not been in several Ages before) did not take away

above a fortieth part of the whole People.)

According to which Account or Measure of doubling, if there be now in *England and Wales*, 7 Millions 400 Thousand People, there were about 5 Millions 526 Thousand in the beginning of Queen Elizabeth's Reign, Anno 1560, and about two Millions at the Norman Conquest, of which Consult the *Dooms-day Book*, and My Lord Hale's *Origination of Mankind*.

Memorandum, That if ^{320 Millions} the People double in 360 ^{ons now in the} Years, that the present 320 ^{World.} Millions computed by some Learned Men, (from the Measures of all the Nations of the World, their degrees of being Peopled, and good Accounts of the People in several of them) to be now upon the face of the Earth, will within the next 2000 Years, so increase, as to give one

Head for every two Acres of Land in the *Habitable* part of the *Earth*. And then, according to the *Prediction* of the *Scriptures*, there must be *Wars* and great *Slaughter*, &c.

Wherefore, as an *Expedient* against the above-mentioned difference between 10 and 1200 Years, we do for the present, and in this Country admit of 360 Years to be the time wherein the People of *England* do double, according to the present *Laws* and *Practice* of *Marriages*.

Now, if the *City* double its People in 40 Years, and the present Number be 670 Thousand, and if the whole *Territory* be 7 Millions 400 Thousand, and double in 360 Years as aforesaid; then by the underwritten Table it appears, that *Ann* 1840, the People of the *City* will be 10718880, and those of the whole *Country* but 10917389, which is but inconsiderably more. *Where*

fore it is certain and necessary that the *Growth* of the City must stop before the said Year 1840; and will be at its utmost height in the next preceeding Period, *Anno* 1800, when the Number of the City will be Eight times its present Number, *viz.* 5 Millions 359 Thousand. And when (besides the said Number) there will be 4 Millions 466 Thousand to perform the *Tillage*, *Pasturage*, and other Rural Works necessary to be done without the said City, as by the following Table, *viz.*

	{ <i>Annis.</i> }	{ <i>Burials.</i> }	{ <i>People in</i> <i>London.</i> }	{ <i>People in</i> <i>England.</i> }
	1565 —	2568	77040	5526929.
As in the	1605 —	5135		
former	1642 —	11883		
Table. }	1682 —	22331	669930	7369230.
	1722 —	44662		
	1762 —	89324		
	1802 —	178648	5359440	9825650.
	1842 —	357296	10718889	10917389.

That *London* will be at its highest growth, and eight times as great as now, *Anno 1800.*

Now, when the People of *London* shall come to be so near the People of all *England*, Then it follows, that the *Growth* of *London* must stop before the said Year 1842, as aforesaid, and must be at its greatest height *Anno 1800*, when it will be eight times more than now, with above 4 Millions for the Service of the *Countrey* and *Ports*, as aforesaid.

A digression of the use of the vast difference between 10 & 1200 Years of doubling.

Of the afore-mentioned vast difference between 10 Years and 1200 Years for doubling the People, we make this use, *viz.* To justify the *Scriptures* and all other good *Histories* concerning the *Number* of the People in Ancient Time. For supposing the Eight *Persons* who came out of the *Ark*, Increased by a Progressive doubling in every 10 Years, might grow in the

first 100 Years after the *Flood* from 8 to 8000, and that in 350 Years after the *Flood* (when abouts *Noah* died) to one Million, and by this time 1682, to 320 Millions (which by rational conjecture, are thought to be now in the World) it will not be hard to compute, how in the intermediate Years, the *Growths* may be made, according to what is set down in the following *Table*, wherein making the doubling to be 10 Years at first, and within 1200 Years at last, we take a discretionary liberty, but justifiable by Observations and the Scriptures for the rest, which *Table* we leave to be Corrected by *Historians*, who know the bigness of *Ancient Cities*, *Armies*, and *Colonies* in the respective *Ages* of the *World*, in the mean time affirming that without such difference in the *Measures* and *Periods* for doubling (the extremes whereof we have demonstrated

ted to be real and true) it is impossible to solve what is written in the *Holy Scriptures* and other *Authentick Books*. For if we pitch upon any one Number throughout for this purpose, 150 Years is the fittest of all round Numbers; according to which, there would have been but 512 Souls in the whole World in *Moses's* time (being 800 Years after the Flood) when 603 Thousand *Israelites* of above 20 Years Old (besides those of other Ages, Tribes, and Nations) were found upon an exact Survey appointed by God, whereas our Table makes 12 Millions. And there would have been but 8000 in *David's* Time, when were found 1100 Thousand of above 20 Years Old (besides others, as aforesaid) in *Israel*, upon the Survey instigated by Satan, whereas our Table makes 32 Millions. And there would have been but a quarter of a

Million about the Birth of Christ, or *Augustus* his Time, when *Rome* and the *Roman Empire* were so great, whereas our Table makes 100 Millions. Where Note, That the *Israelites* in about 500 Years between their coming out of *Egypt* to *David's* Reign, increased from 603 Thousand to 1100 Thousand.

On the other hand, if we pitch upon a less Number, as 100 Years, the World would have been over-peopled 700 Years since. Wherefore no one Number will solve the *Phænomena*, and therefore we have supposed several in Order to make the following Table, which we again desire Historians to Correct, according to what they find in Antiquity concerning the Number of the People in each Age and Countrey of the World.

We did (not long since) assist a worthy Divine, writing against some

Scepticks, who would have baffled our belief of the Resurrection, by saying, that the whole Globe of the Earth could not furnish Matter enough for all the Bodies that must Rise at the last Day, much less would the surface of the Earth furnish footing for so vast a Number; whereas we did (by the Method aforementioned) assert the Number of Men now living, and also of those that had died since the beginning of the World, and did withal shew, that half the Island of *Ireland* would afford them all, not onely Footing to stand upon, but Graves to lie down in, for that whole Number; and that two Mountains in that Countrey were as weighty as all the Bodies that had ever been from the beginning of the World to the Year 1680, when this Dispute happened. For which purpose, I have digressed from my intended purpose, to insert

this Matter, intending to prosecute this hint further, upon some more proper Occasion.

A Table shewing how the People might have doubled in the several Ages of the World.

Years after the Flood.

Periods of doubling	Years	Persons.
	1	1
	10	16
	20	32
	30	64
	40	128
In 10 Years	50	256
	60	512
	70	1024
	80	2048
	90	4096
	100	8000 and more.
In 20 Years	120 Years after the Flood.	16 Thousand.
	140	32
	170	64
30	200	128
40	240	256
50	290	512
60	350	1 Million and more.
70	420	2 Millions.
100	520	4 Millions.
190	710	8 Millions.
290	1000	16 In Moes Time.
400	1400	32 About Davids Time.
550	1950	64
750	2700	128 About the Birth of Christ.
1000	3700	256
In 300	4000	320
1200		

It is here to be Noted, That in this Table we have assigned a different Number of Years for the time of doubling the People in the several Ages of the *World*, and might have done the same for the several *Countries* of the *World*, and therefore the said several *Periods* assigned to the *whole World* in the *Lump*, may well enough consist with the 360 Years especially assigned to *England*, between this day, and the *Norman Conquest*; And the said 360 Years may well enough serve for a Supposition between this time, and that of the *Worlds* being fully Peopled; Nor do we lay any stress upon one or the other in this disquisition concerning the *Growth* of the City of *London*.

We have spoken of the *Growth* of *London*, with the Measures and Periods thereof, we come next to the Causes and Consequences of the same.

The Causes of its Growth from 1642 to 1682, may be said to have been as followeth, *viz.* From 1642 to 1650, that Men came out of the Countrey to London, to shelter themselves from the Outrages of the Civil Wars, during that time; from 1650 to 1660, the Royal Party came to London, for their more private and inexpensive Living; from 1660 to 1670, the Kings Friends and Party came to receive his Favours after his Happy Restauration; from 1670 to 1680, The frequency of Plots and Parliaments, might bring extraordinary Numbers to the City; But what Reasons to assign for the like Increase from 1604 to 1642, I know not, unless I should pick out some Remarkable Accident happening in each part of the said Period, and make that to be the Cause of this the Increase (as Vulgar People make the Cause of every Mans Sicknes, to be what

what he did last eat) wherefore, rather than so to say *quidlibet de quolibet* ; I had rather quit even what I have above-said to be the Cause of *London's Increase* from 1642 to 1682, and put the whole upon some Natural and Spontaneous *Benefits* and *Advantages* that Men find by living in great more than in small *Societies* ; and shall therefore seek for the *Antecedent Causes* of this *Growth*, in the *Consequences* of the like, considered in greater *Characters* and *Proportions*.

Now, whereas in Arithmetick, out of two false *Positions* the Truth is extracted, so I hope out of two *extravagant* contrary Suppositions, to draw forth some solid and consistent *Conclusion*, viz.

The first of the said two Suppositions is, That the City of *London* is seven times bigger than now, and that the *Inhabitants* of it are four
Mil-

[31]
Millions 690 Thousand People; and that in all the other *Cities*, *Ports*, *Towns*, and *Villages*, there are but two Millions 710 Thousand more.

The other *Supposition* is, That the City of *London* is but a seventh part of its present bigness, and that the *Inhabitants* of it are but 96 Thousand, and that the rest of the *Inhabitants* (being 7 Millions 304 Thousand) do Co-habit thus, 104 Thousand of them in small *Cities* and *Towns*, and that the rest, being seven Millions 200 Thousand, do Inhabit in *Houses* not contiguous to one another, viz. In 1200 Thousand Houses, having about 24 Acres of Ground belonging to each of them, accounting about 28 Millions of Acres to be in the whole *Territory* of *England*, *Wales*, and the adjacent *Islands*; which any Man that pleases, may Examine upon a good Map.

C

Now,

Now, the Question is, In which of these two Imaginary states, would be the most convenient, commodious, and comfortable Livings?

But this general Question divides it self into the several Questions, relating to the following Particulars, *viz.*

1. For the *Defence* of the Kingdom against *Forreign Powers*.

2. For preventing the *Intestine Commotions* of *Parties* and *Factions*.

3. For *Peace* and *Uniformity* in *Religion*.

4. For the *Administration* of *Justice*.

5. For the proportionably *Taxing* of the *People*, and *ease* *Laying* the *same*.

6. For *Gain* by *Forreign Commerce*.

7. For *Husbandry*, *Manufacture*, and for *Arts* of *Delight* and *Ornament*.

8. For

8. For lessening the Fatigue of Carriages and Travelling.

9. For preventing Beggars and Thieves.

10. For the Advancement and Propagation of Useful Learning.

11. For Increasing the People by Generation.

12. For preventing the Mischiefs of Plagues and Contagions. And withal, which of the said two states is most Practicable and Natural; for in these and the like particulars, do lie the Tests and Touch-stones of all Proposals, that can be made for the Publick Good.

First, as to *Practicable*, we say, That although our said Extravagant Proposals are both in Nature possible, yet it is not Obvious to every Man to conceive, how London, now seven times bigger than in the beginning of Queen Elizabeths Reign, should be seven times bigger than now it is,

and 49 times bigger than *Anno* 1560. To which I say, 1. That the present City of *London* stands upon less than 2500 Acres of Ground, wherefore a City seven times as large may stand upon 10500 Acres, which is about equivalent to a Circle of four Miles and a half in Diameter, and less than 15 Miles in Circumference. 2. That a Circle of Ground of 35 Miles Semidiameter will bear *Corn*, *Garden-stuff*, *Fruits*, *Hay*, and *Timber* for the four Millions 690 Thousand Inhabitants of the said City and Circle, so as nothing of that kind need be brought from above 35 Miles distance from the said City; for the Number of Acres within the said Circle, reckoning two Acres sufficient to furnish *Bread* and *Drink-Corn* for every Head, and two Acres will furnish *Hay* for every Necessary Horse; And that the Trees, which may grow in the Hedge-rows of the Fields

Fields within the said Circle ; may furnish Timber for 600 Thousand Houses. 3. That all live Cattel and great Animals can bring themselves to the said City ; and that Fish can be brought from the *Lands-end* and *Berwick* as easily as now. 4. Of Coals there is no doubt : And for Water, 20 s. per Family (or 600 Thousand pounds per *Annum* in the whole) will serve this City, especially with the help of the *New-River*. But if by Practicable be understood, that the present State may be suddenly changed into either of the two above-mentioned Proposals, I think it is not *Practicable*. Wherefore the true Question is, unto or towards which of the said two Extravagant states it is best to bend the present state by degrees, *viz.* Whether it be best to lessen or enlarge the present City? In Order whereunto, we enquire (as to the first Question) which

C. 2

state

state is most *Defensible* against *Foreign Powers*, saying, That if the above-mentioned *Housing*, and a border of *Ground*, of 3 quarters of a *Mile* broad, were encompassed with a *Wall* and *Ditch* of 30 *Miles* about (as strong as any in *Europe*, which would cost but a *Million*, or about a *Penny* in the *shilling* of the *House-Rent* for one *Year*) what *Foreign Prince* could bring an *Army* from beyond *Seas*, able to beat, 1. Our *Sea-Forces*, and next with *Horse* harras'd at *Sea*, to resist all the fresh *Horse* that *England* could make, and then *Conquer* above a *Million* of *Men*, well *United*, *Disciplin'd*, and *Guarded* within such a *Wall*, distant every-where 3 quarters of a *Mile* from the *Housing*, to elude the *Granadoes* and great *Shot* of the *Enemy*? 2. As to *Intestine Parties* and *Factions*, I suppose that 4 *Millions* 690 *Thousand* *People* *United* within this great *City*.

City, could easily Govern half the said Number scattered without it, and that a few Men in Arms within the said City, and Wall, could also easily Govern the rest unarmed, or Armed in such a manner as the Sovereign shall think fit. 3. As to Uniformity in Religion, I conceive, That if *St. Martins* Parish (may as it doth) consist of about 40 Thousand Souls, That this great City, also may as well be made but as one Parish, with 7 times 130 Chappels, in which might not onely be an Uniformity of Common Prayer, but in Preaching also; for that a thousand Copies of one Judiciously and Authentically Composed *Sermon*, might be every Week read in each of the said Chappels without any subsequent Repetition of the same, as in the Case of Homilies. Whereas in *England* (wherein are near 10 Thousand Parishes, in each of which upon Sundays, Holy-days,

and other Extraordinary Occasions, there should be about 100 Sermons *per Annum*, making about a Million of Sermons *per Annum* in the whole:) It were a Miracle, if a Million of Sermons Composed by so many Men, and of so many Minds and Methods, should produce *Uniformity* upon the discomposed understandings of about 8 Millions of Hearers.

4. As to the *Administration* of *Justice*. If in this great City shall dwell the Owners of all the Lands, and other Valuable things in *England*; If within it shall be all the *Traders*, & all the *Courts*, *Offices*, *Records*, *Juries*, and *Witnesses*; Then it follows, that *Justice* may be done with speed and ease.

5. As to the *Equality* and *ease* *Levy*ing of Taxes. It is too certain, That *London* hath at some times paid near half the *Excise* of *England*; and that the People pay
thrice

thrice as much for the Hearths in *London* as those in the Countrey, in proportion to the People of each, and that the Charge of Collecting these Duties, have been about a sixth part of the Duty it self. Now, in this great City, the Excise alone according to the present Laws, would not onely be double to the whole Kingdom, but also more equal. And the Duty of Hearths of the said City, would exceed the present proceed of the whole Kingdom. And as for the *Customs*, we mention them not at present.

6. Whether more would be gain'd by *Forreign Commerce*?

The Gain which *England* makes by *Lead*, *Coals*, the Freight of Shipping, &c. may be the same, for ought I see, in both cases. But the Gain which is made by *Manufactures*, will be greater, as the Manufacture it self is greater and better. For in so vast

a City *Manufactures* will beget one another, and each *Manufacture* will be divided into as many parts as possible, whereby the Work of each *Artisan* will be simple and easie; As for Example. In the making of a *Watch*, If one man shall make the *Wheels*, another the *Spring*, another shall Engrave the *Dial-plate*, and another shall make the *Cases*, then the *Watch* will be better and cheaper, than if the whole Work be put upon any one Man. And we also see that in *Towns*, and in the *Streets* of a great *Town*, where all the *Inhabitants* are almost of one Trade, the Commodity peculiar to those places is made better and cheaper than elsewhere. Moreover, when all sorts of *Manufactures* are made in one place, there every Ship that goeth forth, can suddenly have its Loading of so many several Particulars and Species, as the Port whereunto she is bound can

can take off. Again, when the several *Manufactures* are made in one place, and Shipped off in another, the *Carriage, Postage, and Travelling-charges* will Inhance the Price of such *Manufacture*, and lessen the Gain upon *Forreign Commerce*. And lastly, when the Imported Goods are spent in the Port it self, where they are Landed the Carriage of the same into other places, will create no surcharge upon such Commodity; all which particulars tends to the greater Gain by *Forreign Commerce*.

7. As for *Arts of Delight and Ornament*.

They are best promoted by the greatest Number of *Emulators*. And it is more likely that one *Ingenious Curious Man* may rather be found out amongst 4 Millions than 400 Persons. But as for *Husbandry*, viz. *Tillage and Pasturage*, I see no Reason, but the second state (when each

each Family is charged with the Culture of about 24 Acres) will best promote the same.

8. As for lessening the Fatigue of *Carriage and Travelling*.

The thing speaks it self, for if all the Men of Business, and all *Artisans* do Live within five Miles of each other: And if those who Live without the great City, do spend onely such Commodities as grow where they Live, when the charge of *Carriage and Travelling* could be little.

9. As to the preventing of *Beggars and Thieves*.

I do not find how the differences of the said two states should make much difference in this particular; for Impotents (which are but one in about 600) ought to be maintained by the rest. 2. Those who are unable to Work, through the evil Education of their *Parents*, ought (for ought I know) to be main-

tained by their nearest Kinred, as a just Punishment upon them. 3. And those who cannot find Work (though able and willing to perform it) by reason of the unequal application of Hands to Lands, ought to be provided for by the *Magistrate* and *Land-Lord* till that can be done; for there needs be no *Beggars* in Countries, where there are many Acres of unimproved improvable Land to every Head, as there are in *England*. As for *Thieves*, they are for the most part begotten from the same cause; for it is against Nature, that any Man should venture his Life, Limb, or Liberty, for a wretched Livelihood, whereas moderate Labour will produce a better. But of this see *Sir Thomas Moor*, in the first part of his *Utopia*.

10. As to the *Propagation* and *Improvement of Useful Learning*.

The same may be said concerning it, as was above-said concerning *Mannufactures*.

manufactures, and the *Arts* of *Delight* and *Ornaments*; for in the great vast City, there can be no so odd a Conceit or Design, whereunto some Assistance may not be found, which in the thin, scattered way of Habitation may not be.

11. As for the *Increase* of *People* by *Generation*.

I see no great difference from either of the two states, for the same may be hindred or promoted in either, from the same Causes.

12. As to the *Plague*.

It is to be remembred, that one time with another, a *Plague* happeneth in *London* once in 20 Years, or thereabouts; for in the last hundred Years, between the Years 1582 and 1682, there have been five great *Plagues*, viz. Anno 1592, 1603, 1625, 1636, and 1665. And it is also to be remembred, that the *Plagues* of *London* do commonly kill one fifth

part of the *Inhabitants*. Now, if the whole People of *England* do double but in 360 Years, then the Annual Increase of the same is but 20000, and in 20 Years 400000. But if in the City of *London* there should be two Millions of People, (as there will be about 60 Years hence) then the *Plague* (killing one fifth of them, namely, 400000, once in 20 Years) will destroy as many in one Year, as the whole Nation can re-furnish in 20: And consequently the People of the Nation shall never Increase. But if the People of *London* shall be above 4 Millions (as in the first of our two *Extravagant* Suppositions is premised) then the People of the whole Nation shall lessen above 20000 *per Annum*. So as if People be worth 70 *l. per Head* (as hath elsewhere been shewn) then the said greatness of the City will be a damage to it self and the whole Nation of 14 hundred Thousand

sand pounds *per Annum*, and so *pro*
rata, for a greater or lesser Number ;
 wherefore to determine, which of the
 two *states* is best, (that is to say, to-
 wards which of the said two *states*
Authority should bend the present *state*)
 a just Balance ought to be made be-
 tween the disadvantages from the
Plague, with the Advantages accruing
 from the other Particulars above-men-
 tioned ; unto which *Balance* a more
 exact Account of the People, and a
 better Rule for the Measure of its
 Growth is Necessary, than what we
 have here given, or are yet able to lay
 down.

Post-

Postscript.

IT was not very pertinent to a *Discourse* concerning the *Growth* of the City of *London*, to thrust in Considerations of the Time when the whole *World* will be fully Peopled; and how to justify the *Scriptures* concerning the Number of People mentioned in them; and concerning the Number of the Quick and the Dead, that may rise at the last Day, &c. Nevertheless, since some Friends liking the said Digressions and Impertinencies (perhaps as Sawce to a dry Discourse) have desired that the same might be explained and made out: I therefore say as followeth.

1. If the Number of Acres in the Habitable part of the Earth, be under 50 Thousand millions: if Twenty

D

Thou-

Thousand millions of People, are more than the said Number of Acres will feed; (few or no Countries being so fully Peopled;) and for that in six doublings (which will be in 2000 Years) the present 320 millions will exceed the said 20 Thousand millions.

2. That the Number of all those who have died since the *Flood*, is the sum of all the Products made by multiplying the Number of the doubling Periods mentioned in the first Column of the last Table, by the Number of People respectively affixed to them, in the third Column of the same Table; the said Sum being Divided by 40 (one dying out of 40 per *Annum*, out of the whole Mass of Mankind) which Quotient is 12570 millions; Whereunto may be added, for those that died before the *Flood*, enough to make the last mentioned Number 20 Thousand millions, as the full Number of all that died.

died, from the beginning of the World, to the Year 1682; unto which, if 320 millions, the Number of those who are now alive, be added, the Total of the Quick and the Dead, will amount but unto one fifth part of the Graves, which the surface of *Ireland* will afford, without ever putting two Bodies into any one Grave; for there be in *Ireland* 28 Thousand square *English* miles, each whereof will afford about 4 millions of Graves, and consequently above 114 Thousand millions of Graves, *viz.* about 5 times the Number of the Quick and the Dead, which should arise at the last Day, in case the same had been in the Year 1682.

3. Now, if there may be place for five times as many Graves in *Ireland*, as are sufficient for all that ever died; And if the Earth of one Grave weigh five times as much as the Body interr'd therein, then a Turf, less than a foot